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ABSTRACT

This 35-item, multiple-choice Marine Education Knowledge Inventory was developed for use in upper elementary/middle schools to measure a student's knowledge of marine science. Content of test items is drawn from oceanography, ecology, earth science, navigation, and the biological sciences (focusing on marine animals). Steps in the construction of the inventory (KR-20 of 0.70) are also provided. (Author/JN)

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Marine Education Knowledge Inventory

developed by

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MARINE EDUCATION KNOWLEDGE INVENTORY

Directions

This inventory is made up of a number of statements and questions related to the ocean. Read each statement and decide which line correctly completes the statement or which is the correct answer to the question. Circle the letter a, b, c or d on your answer sheet that matches your choice.

Sample

1. The seahorse belongs to which group?
 - a. cartilaginous fish
 - b. bony fish
 - c. mollusks
 - d. mammals

(Answer sheet)

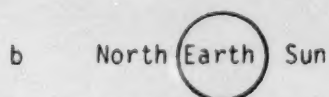
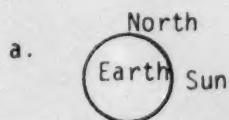
1. a ☒ b c d

1. Longitude lines run
 - a. horizontally on a globe
 - b. vertically from North Pole to South Pole
 - c. both vertically and horizontally depending on the hemisphere
 - d. none of the above
2. Polaris, our best known position star, is often called the
 - a. Star of the East
 - b. South Star
 - c. Great Western Star
 - d. North Star
3. A sound is a body of water
 - a. between the mainland and an island
 - b. between islands
 - c. on the ocean side of an island
 - d. none of the above
4. Along the east coast of the United States, high tides occur about every
 - a. six hours
 - b. twelve hours
 - c. eighteen hours
 - d. twenty-four hours
5. When it is high tide on one side of the earth, the opposite side of the earth experiences
 - a. low tide
 - b. high tide
 - c. flood tide
 - d. ebb tide
6. Tides are heavily influenced by
 - a. the moon
 - b. the sun
 - c. the stars
 - d. water temperature
7. Erosion of coastal beaches occurs because of
 - a. wind and wave action
 - b. changes in sea level
 - c. ice
 - d. none of the above

8. A swimmer or ship will float higher in seawater than in freshwater because
 - a. the density of freshwater is greater than seawater
 - b. the density of seawater is greater than freshwater
 - c. there are more dissolved gases in the seawater
 - d. the freshwater is heavier than the seawater
9. Most beach sand comes from
 - a. water wearing away rocks
 - b. sun evaporating salt
 - c. gravel pits
 - d. pieces of glass
10. On a hot summer day, air over the beach is
 - a. warmer than air over the ocean
 - b. cooler than air over the ocean
 - c. the same temperature as air over the ocean
 - d. the same temperature as the ocean water
11. Salt marshes may be disappearing because
 - a. the oceans are growing larger
 - b. marsh water is draining into the oceans
 - c. people are filling in the marshes to make more land
 - d. there is less rain to fill the marshes
12. Most pollutants from the land are carried to the ocean by
 - a. wind
 - b. rivers
 - c. rain
 - d. clouds
13. Some species of fish were caught in great numbers in the past, but the harvest is lower now because
 - a. not as many people want to eat fish so there is less demand for them
 - b. there are fewer people interested in fishing for a living
 - c. the world's climate is changing, which has had a bad effect on the size of fish populations
 - d. the fish populations are much smaller
14. At the base of a food chain in the oceans one would expect to find
 - a. shrimp
 - b. herring
 - c. clams
 - d. diatoms

15. Egrets eat fiddler crabs and the fiddler crabs eat algae. In this example, the crabs are
 - a. producers
 - b. decomposers
 - c. consumers
 - d. scavengers
16. An example of a food chain in the sea is
 - a. shrimp, clam, flounder
 - b. algae, clam, starfish
 - c. clam, algae, whale
 - d. clam, oyster, mussel
17. Where are the nurseries located for marine species that are economically important to North Carolina?
 - a. salt marshes
 - b. coastal sounds
 - c. coastal rivers
 - d. all of the above
18. Sharks and rays have skeletons made of
 - a. bone
 - b. muscle
 - c. cartilage
 - d. chitin
19. What do whales have for breathing?
 - a. gills
 - b. stomato
 - c. lungs
 - d. trachea
20. Whales have babies by
 - a. hatching eggs
 - b. live birth
 - c. budding
 - d. regeneration
21. Oysters belong to a group of animals called
 - a. mollusks
 - b. finfish
 - c. crustaceans
 - d. origami

22. Jellyfish do not live in lakes because lakes
- a. are not salty enough
 - b. do not have food
 - c. have too many jellyfish enemies
 - d. are too shallow
23. Flounder is a/an
- a. mollusk
 - b. finfish
 - c. crustacean
 - d. origami
24. Of the following animals, the most closely related are
- a. fish and whale
 - b. snail and clam
 - c. clam and oyster
 - d. octopus and jellyfish
25. Seafood is a good source of
- a. protein
 - b. iodine
 - c. vitamins A and D
 - d. all of the above
26. The first attempt at English colonization of the New World occurred at
- a. Ocracoke
 - b. Roanoke Island
 - c. Kitty Hawk
 - d. Cape Hatteras
27. Latitude lines are
- a. horizontal on a globe
 - b. vertical from North Pole to South Pole
 - c. both vertical and horizontal depending on the hemisphere
 - d. none of the above
28. If the sun comes up as shown, which direction is north?



d. None of the above

29. At night, if you face Polaris, east will be
- to your left
 - behind you
 - to your right
 - none of the above
30. Stars seem to rise and set each day primarily because
- the earth is revolving on its axis
 - the sun moves behind the stars
 - the stars are moving around the earth
 - none of the above
31. If a navigator takes a heading of 180° it means they are heading
- north
 - east
 - south
 - west
32. "May Day" is a
- distress call
 - name of one of Columbus' ships
 - another name for Memorial Day
 - another name for Labor Day
33. Loran
- transmits a radio signal to two distant slave stations which retransmit the signals
 - measures the time a sound pulse takes to reach the bottom and return
 - transmits a super high frequency signal from a rotating antenna
 - is really a "ship-to-shore" radio
34. Which star in the Little Dipper is the North Star?
- the first star in the handle
 - the second star in the handle
 - the third star in the handle
 - none of the above
35. Etching or scratching outlines on bone, ivory or plastics, often practiced by sailors, is called
- macrame
 - scrimshaw
 - needlepoint
 - shown dew

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The Marine Education Knowledge Inventory was developed for use in upper elementary/middle schools to measure a student's knowledge of marine science. Test construction procedures involved

1. identification of major marine science concepts important for upper elementary/middle school students. This involved computer searches and analysis of the literature, surveys of leaders in marine education from across the nation; surveys of science education specialists and surveys of teachers.
2. generation of an item bank. Sources were teachers in the field involved with teaching marine science, existing instruments (with permission where required), and test-developers.
3. matching of items from the item bank to concepts deemed important.
4. initial screening for clarity and appropriateness (reading level and level of understanding)
5. evaluation by a panel of experts with screening based on panel analysis
6. development of experimental version with answer sheets
7. field testing with between 3 and 4 hundred students, including coastal and inland locations
8. computer scoring and analysis for discrimination and difficulty
9. elimination of weak items indicated by computer analysis and preparation of the final version
10. administered to over two hundred students with a KR-20 of 0.70.